LCD TV

SERVICE MANUAL

LS07 CHASSIS

Please read this manual carefully before operation

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Attachment:

One Schematic diagraph of LS07 chassis LCD TV

Two Assemble diagraph of LS07 chassis LCD TV

Three Connection diagraph of LS07 chassis LCD TV

Chapter One Specification , feature and the Constitution

One The Technical Specification of F Series LCD TV:

The F series LCD TV which adopts LS07 chassis include 5 types of Product:

1□ CHD-TM150F7:

Max display format:1024*768(XGA), Audio power output:2*2.0W, voltage:DC12V, Power adapter voltage :AC 110□240W,50/60HZ,power adapter Model number:CHA-1204.

2□CHD-TD170F7

Max display format:1280*768(WXGA), Audio power output:2*2.0W,AC input voltage of inside power Mold piece:AC 110□240V,50/60HZ, the unit sets AC power Switch ,DVD Mold piece inside.

3□ CHD-W170F7

Max display format:1280*768(WXGA), Audio power output:2*2.0W,AC input voltage of inside power Mold piece:AC 110□240V,50/60HZ, the unit sets AC power Switch.

4□ CHD-TD201F7

Max display format:640*480(VGA), Audio power output:2*2.0W,AC input voltage of inside power mold piece: AC 110□240V,50/60HZ, the unit sets AC power Switch ,DVD mold piece inside.

5□ CHD-TM201F7

Max display format:640*480(VGA), Audio power output:2*2.0W,AC input voltage of inside power mold piece: AC 110□240V,50/60HZ, the unit sets AC power Switch.

Two Main feature□

1□ RF input ,CATV function

Can receive 470MHZ CATV Programs, can store 236 programs (Program number display 0□235);

2□ AV Audio and AV Video input

Can receive video Signal of PAL□NTSC and SECAM system, so you can watch the programs from VCR ,DV□and all kinds of Video-disc player Conveniently, bring you perfect Audio-visual effect.

3□Y/C component video input

S-VIDEO input, can receive high defintion Y/C component Signal from such as DVD Conveniently .

4□ YPbPr input

can receive high definition YPbPr component video signal from such as DVD Conveniently . Support format:480I□480P□576I□576P□720P□50/60HZ□□1080I

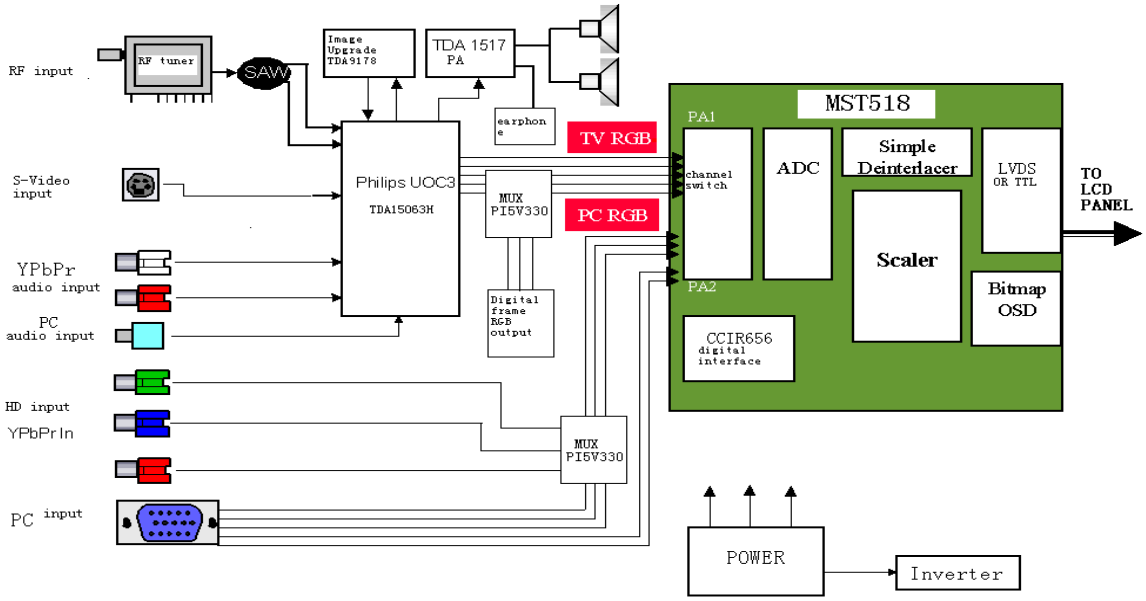
□50/60HZ□□1080P□50/60HZ□□
5□ VGA input
As the Terminal display Equipments of computer, it can connect with computer conveniently. it can connect with Computer audio card by its own Audio connection line ,so you can listen the audio information from computer.
6□ Program lock and child lock function
The function of program lock can lock the programs□input password and Modification, the function of child lock can lock the keys.
7□ Timer function
You can set turn on and turn off on time, and power off in 15 min automatically if no signal input. Automatically enter into save energy mode by itself if no signal in PC condition, it can be awaken if signal inputs.
8□ Blue screen mute noise
In condition of TV□AV□S-VIDEO and YPbPr, gentle blue screen will be displayed if no signal input.
9□ Chinese/English menu
Adopt the design of Convenient and Simple graphic menu, you can operate menu more conveniently and more intuition.
10□ Save energy function(power management mode)
When TV is used as PC display terminal, and PC has no output signal . The TV will be power off in about 30 Seconds automatically, and enter into standby condition. press down Power/P+/P-/ Number key of Remote control or the PC signal appearance again, the TV will be on automatically.
11□Plug-and-play
The TV works as the terminal Equipments of computer, need not equip install software□it is real Plug-and-Play.
12□Automatic correct
By its automatic correct function ,the LCD TV can bring you the best view.
13.No Flicker□no Radiation □Green environmental protection
the LCD TV can bring you High quality view, and Avoid Radiation, protect your eyes, Look after your health.
14.Because of it's Advanced power Management mode, the TV can realize standby and recall on function.
15.Zoom image function
Support follow zoom function: Full screen mode□4:3 mode□16:9 TFT□,16:9□4□3 TFT□□Movie mode□Sub-title movie mode.
16.Light weight□small dimention□Low power consumpt
17.Advanced picture quality Strengthen function
Dynamic skin color Correct: Improve distort color in picture, make it Near to real color.
Black level Extension: blacken the more black area of picture, Raise the Contrast in Dark Background.
Color Edge correct: Increase the Steep of color signal edge ,make the edge of color Transition more clearly .

Brightness edge correct: increase the steep of Brightness signal edge, make the edge of picture is more clearly.
18.Five degree Intelligence “The gold ratio”
in many kinds of the Combination from Brightness□contrast□color□defintion□ Sound area, it can calculate the golden Audio-Video Combination effect.
19.Super fine and inner fairness LCD
20.digital comb filter
21.Headphones input
22.DVD Mold piece inside(only CHD-TD201F7/CHD-TD170F7)
121□Compatible with DVD□super VCD□VCD□CD□MP3 etc.
122□Compatible with PAL/NTSC format Disc
123□The high-quality digital audio□SDPIF digital audio output will bring you more really Stereo□more high Sound quality□more strong surround film effect.

Cut off the non-suitable content(only limited DVD disc which have play grade control information)automatically, according to selected play Grade.(max 8 grade)
124□you can choose 32 kinds of OSD language
125□you can choose 8 kinds of sound language(Note: the Quantity of OSD language □sound language is Decided by the Recorded disc)

Three Electric circuit of the TV

The Europe LS07 chassis LCD TV is composed of Steady voltage circuit□ inverter Circuit □RF circuit□video Strengthen circuit□video Processing circuit□ Power Enlarge circuit□VGA circuit□system control circuit and key control circuit. the block diagraph of circuit Constitute is below:



Four PCB Module introduction

The Constitute of the PCB is easier than LP03 chassis, all the Signal Processing are in Main board.

1□Main board Module

Main board Module is the main part of Signal Processing in LCD TV. The input signal is Converted into uniform digital signal which can be Identified by LCM by system control circuit. Main board Module contain two parts of signal processing Module: Philips UOC3 process analog audio and videoo circuit mainly, MST518 process VGA circuit□signal Format transform system control circuit mainly. the front module can convert the video IF signal and audio IF signal from tuner into RGB analog signal and audio signal, this part is named analog audio and video decoding process. The RGB color from UOC is received by MST518 and accomplish A/D convertion , output suitable digital color signal to Drive circuit of TFT . 8051 Processor inside UOC is responsible for co-operation the each part of works in system, and Respond to user operation which is operated on Control panel(key-press panel Module).

2□Key board Module

It is composed of 7 function keys. the user can operate the LCD TV conveniently by using this Module.

3□Remote control receiving board Module

It is composed of a work indicator light and a remote receive head. the user use the remote control box by this module can operate the LCD TV conveniently and know the LCD TV work condition.

4□Earphone output board module

It is composed of a earphone outlet, user can Listen to by earphone conveniently.

5□Inverter board module(include inverter circuit)

The function of the inverter is supply power to light tube in TFT , and lighten the back lamp Unit of TFT moldule, so the user can see the image on TFT.

Chapter two The function introduction LS07 chassis LCD TV's main IC

One The main IC of LS07 chassis

serial number	Name	model	Main function
1	A1	TAF5-C2IP1RW	RF tuner
2	U8□U21	TDA1517AWT	Audio amplifier
3	U3	MST518	AD converter and format change
4	U2	UOC(TDA15063H)	Video decode and MCU control
5	Q9	Si2311DS	MOS switch
6	U11□U12	IRF7316	MOS switch

7	U19	NTMS10P02	MOS switch
8	U23	LM2596-5.0	Liner voltage IC
9	U1	24LC21A	EEPROM(save display parameter information)
10	U4	24LC32A	EEPROM□save user control information□
11	U6□U20	PI5V330A	Video switch

Two The function introduction of main IC

1. MST518 high integration chip

MST518 is a high performance□high integration image processor which is designed for LCD, it can support SXGA format(1280*1024).it integrates a group of AD converter □high quality format transform system□OSD generator□output clock generator□multiple format output display interface(support TTL□LVDS□ RSDS)

MST518 feature:

Have high quality Expand tranform and compress transform, can output XGA format signal

- Integrated LVDS circuit inside
- 8 bit high quality ADC inside
- Double VGA input, Software switch
- Support ITU-656 format signal input
- Support H/V sync□composite sync□green composite sync input, and detect automaticlly by itself
- Programmable 10 bit Gamma correct, the brightness and contrast is adjustable
- 8 color□256 Character OSD
- Built-in DDC circuit inside
- Low standby power
- Support TTL□double LVDS signal output, Software switch

MST518 pin function:

And CPU interface		
Pin	Pin name	Pin function
33	HWRESET	Hardware reset□high voltage enable
82	CS	Chip select signal of three-wire serial bus
83	SDA	data signal of three-wire serial bus
84	SCL	clock signal of three-wire serial bus
85	INT	interrupt
98-91	AD [7:0]	Parallel bus□the chassis is not used
125	BUSTYPE	Bus type select
Analog Interface		
38	HSYNC0	Analog Horizontal sync signal input channel 0
39	VSYNC0	Analog vertical sync signal input channel 0

40	HSYNC1	Analog Horizontal sync signal input channel 1
41	VSYNC1	Analog vertical sync signal input channel 1
78	RMID	Scaler internal reference. voltage
79	REFP	internal ADC decouple □
80	REFM	internal ADC decouple □
75	RIN0	Analog red signal input channel 0
74	RIN0M	Analog red signal input channel 0 re.grounding voltage
73	SOGIN0	Green sync signal input channel 0
72	GIN0	Analog green signal input channel 0
71	GIN0M	Analog green signal input channel 0 re.grounding voltage
70	BIN0	Analog blue signal input channel 0
69	BIN0M	Analog blue signal input channel 0 re.grounding voltage
66	RIN1M	Analog red signal input channel 1 re.grounding voltage
65	RIN1	Analog red signal input channel 1
64	GIN1M	Analog green signal input channel 1 re.grounding voltage
63	GIN1	Analog green signal input channel 1
62	SOGIN1	Green sync signal input channel 1
61	BIN1M	Analog blue signal input channel 1 re.grounding voltage
60	BIN1	Analog blue signal input channel 1
55	REXT	Outside connect 390Ω with 3.3V
LCD Interface		
145	OCLK	Clock output
146	LDE	enable signal
144	LVSYNC	vertical sync output
143	LHSYNC	Horizontal sync output
138	LVA0M	LVDS output 0□
137	LVA0P	LVDS ouput 0+
136	LVA1M	LVDS output 1□
135	LVA1P	LVDS ouput 1+
134	LVA2M	LVDS ouput 2□
133	LVA2P	LVDS output 2+
128	LVA3M	LVDS output 3□
127	LVA3P	LVDS ouput 3+
132	LVACKM	LVDS clock signal ouput□
131	LVACKP	LVDS clock signal ouput +
26-23,18-15	RB[7:0]	TTL red signal channel
14-11, 8-5	GB[7:0]	TTL green signal channel

4,3,154,153,150-147	BB[7:0]	TTL blue signal channel
GPIO Interface		
87	GOUT1/PWM1	PWM output 1
86	GOUT0/PWM0	PWM output 0
2	BYPASS	Outside connect filter capacitor
29	DDC_DAT	Analog interface DDC data
30	DDC_CLK	Analog interface DDC clock
31	DDCROM_CLK	DDC ROM clock
32	DDCROM_DAT	DDC ROM data
34	XIN	Crystal oscillator signal input
35	XOUT	Crystal oscillator signal output
Power Pins		
48, 54, 58, 77	AVDD	A/D convert power supply
56	AVDD_PLL	PLL power supply
36	AVDD_MPLL	MPLL power supply
10, 22, 88, 99, 111, 129, 139, 151	VDDP	Digital signal output power supply
19, 102, 114, 142	VDDC	Digital circuit power supply
1, 9, 20, 21, 37, 42, 45, 51, 57, 59, 76, 81, 89, 100, 101, 112, 113, 130, 140, 141, 152	GND	Digital circuit ground

2. TDA15063H introduction:

The third-generator super integrated circuit UOC III which designed by Philips company recently integrates with video decode□2D comb filter□high quality audio transacting technique, suitable with the European teletext technique and suitable with US closed caption and V-chip function compatiable with single series IC. The series of UOC III have high integraty,besides completing the Processing of all small signal(IF signal demodulation, video decode ,H/V signal, sound DSP),and integrate all the MCU function. it has many Advantages ,example: the compact circuit□good performance□simple craft , ect. it match with company's high performance price ratio and high product efficiency demandings. it is suitable for 4:3 or 16:9□50/60HZ and A100/120HZ TV system, the main characteristic below:

- Multi-system IF demodulation□analog video decode
- Comb filter internal
- Support 4:3□16:9 display format
- 4 CVBS or 3 Y/C input,1 CVBS output,2 YcrCb/2 RGB input
- 4 AV audio input,1 AV adjustable audio volume output
- Volume auto level control circuit
- Global FM demodulation

- Picture quality enhancement of dynamic peak value control□skin color correct□Gamma correct□Black level extension,etc
- Can turn down horizon and vertical scan part□output H/V sync. signal to Scaler
- 128K Flash Memory inside, support program on line
- Automatic Y/C signal identify

TDA15063H pin function:

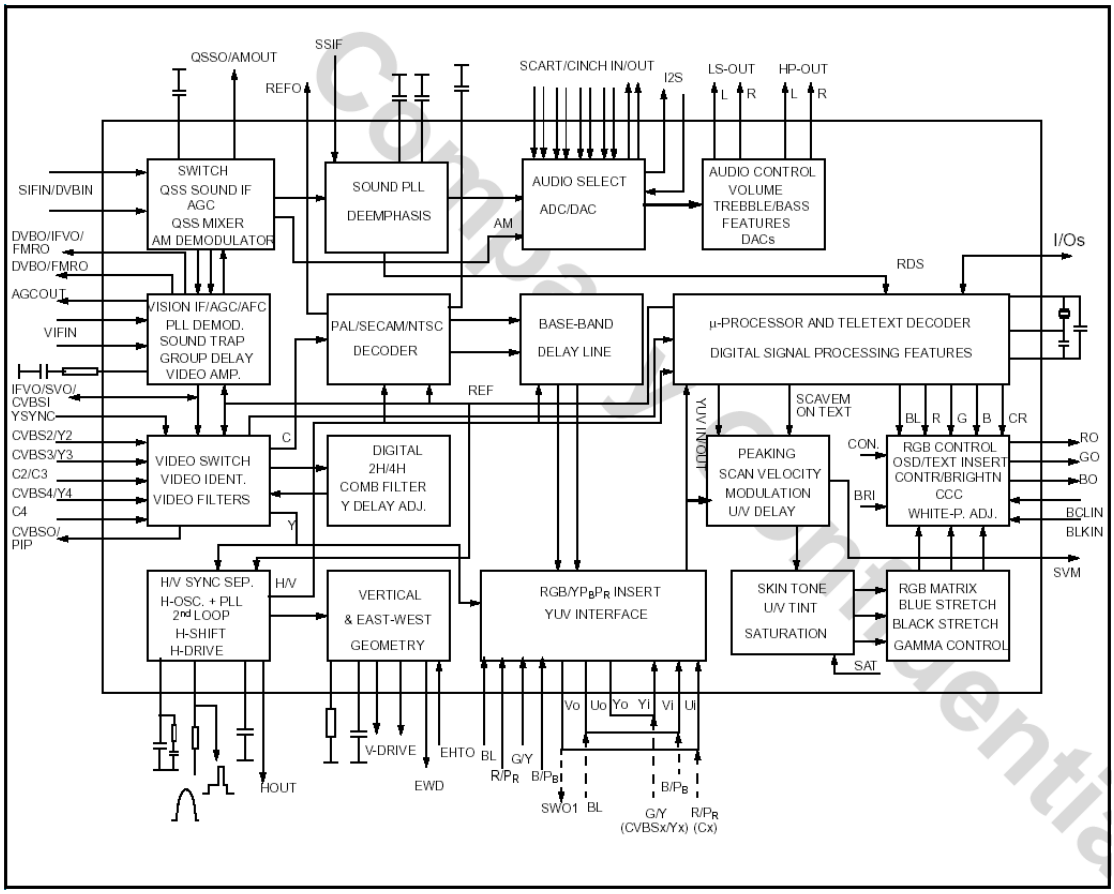
pin	Pin name	Pin function
1	VSSP2	Grounding
2	VSSC4	Grounding
3	VDDC4	+1.8V
4	VDDA3	+3.3V
5	VREF_POS_LSL	+3.3V
6	VREF_NEG_LSL+HPL	0V
7	VREF_POS_LSR+HPR	+3.3V
8	VREF_NEG_HPL+HPR	0V
9	VREF_POS_HPR	+3.3V
10	XTALIN	crystal oscillator input
11	XTALOUT	crystal oscillator output
12	VSSA1	Grounding
13	VGUARD/SWIO	Protecting voltage input or I/O
14	DECDIG	DECDIG signal input
15	VP1	+5V
16	PH2LF	The second grade horizontal phase lock filter
17	PH1LF	The first grade horizontal phase lock filter
18	GND1	Grounding
19	SECPLL	SECAM PLL decouple
20	DECBG	Inside reference voltage decouple
21	EWD/AVL	VDD5A voltage input
22	VDRB	Tv vertical sync signal output
23	VDRA	vertical sync output
24	VIFIN1	VIFinput 1
25	VIFIN2	VIFinput 2
26	VSC	Outside connect vertical ramp capacity
27	IREF	Re.current input
28	GNDIF	IF grounding
29	SIFIN1	SIF input 1
30	SIFIN2	SIF input 2
31	AGCOUT	tuner RF AGC control voltage output
32	EHTO	overvoltage protection input
33	SSIF	MUTE control signal input
34	AUDIOIN5L	Av left track signal input

35	AUDIOIN5R	Av right track signal input
36	AUDOUTSL	SCART/CINCH left track output
37	AUDOUTSR	SCART/CINCH right track output
38	DECSDEM	Track demodulator decouple
39	QSSO	Deemphasis capacitor
40	GND2	grounding
41	PLLIF	IF_PLL filter
42	SIFAGC	Sound intermediate frequency auto gain control
43	IFVO	IF demodulation video output
44	FMRO	Fm broadcast output
45	VCC8V	The supply voltage of Sound switch
46	AGC2SIF	The second sound intermediate frequency auto gain control
47	VP2	+5V
48	IFVO	The video output of Choose channel
49	AUDIOIN4L	HD signal left track audio output
50	AUDIOIN4R	HD signal right track audio output
51	CVBS4/Y4	S-video luminance signal input
52	C4	S-video chroma signal input
53	AUDIOIN2L	PC signal left track audio input
54	AUDIOIN2R	PC signal right track audio input
55	CVBS2/Y2	AV CVBS signal input
56	AUDIOIN3L	Inside DVD module left track audio input
57	AUDIOIN3R	Inside DVD module right track audio input
58	CVBS3/Y3	Inside DVD module brightness signal input
59	C2/C3	Inside DVD module chroma signal input
60	AUDOUTLSL	Main channel left track output
61	AUDOUTLSR	Main channel right track output
62	AUDOUTHPL	Earphone channel left track output
63	AUDOUTHPR	Earphone channel right track output
64	CVBS/PIP	CVBS/PIP output
65	SVM	Scan modulate output
66	FBISO	flyback input/sandcastle output or composite H/V timing output
67	HOUT	Horizontal sync signal output
68	VSScomb	Grounding
69	VDDcomb	+5V
70	VIN	V signal input
71	UIN	U signal input
72	YIN	Y signal input
73	YSYNC	Y signal input for Sync separate
74	YOUT	Y signal output
75	UOUT	U signal output

76	VOUT	V signal output
77	INSSW3	RGB/YpbPr insert identify signal input
78	R/PrIN3	R/Pr signal input
79	G/YIN3	G/Y signal input
80	B/PbIN3	B/Pb signal input
81	GND3	grounding
82	VP3	+5V
83	BCLIN	beam current limiter input
84	BLKIN	Black current input
85	RO	R basic color signal input
86	GO	G basic color signal output
87	BO	B basic color signal output
88	VDD3	+3.3V
89	VREFAD_NEG	0V
90	VREFAD_POS	+3.3V
91	VREFAD	Audio ADC re.voltage
92	GNDA	grounding
93	VDDA	+1.8V
94	VDD3A	+3.3V
95	VSSADC	grounding
96	VADC	+1.8V
97	INT0	Remote control signal input
98	P10/INT1	DPF clock line
99	P11/T0	DPFdata line
100	VDDC2	+1.8V
101	VSSC2	grounding
102	P04/12SWS	MST reset signal
103	P03/12SCLK	HD_Pc select control signal
104	P02/12SDO2	Power Amplifier standby control signal
105	P01/12SDO1	TV_DPF select control signal
106	P00/12SDII/O	Turn on control signal
107	P13/T1	MST chip select signal
108	P16/SCL	UOCI2C bus clock line
109	P17/SDA	UOCI2C bus data line
110	VDDP	+3.3V
111	P20/TPWM	Red indicator light control signal
112	P21/PWM0	green indicator light control signal
113	P22/PWM1	TFT power supply control signal
114	P23/PWM2	Inside DVD module power supply control signal
115	P30/ADC0	Reserve IO port
116	P31/ADC1	Earphone insert identify signal input
117	VDDC1	+1.8V
118	VDD18	+1.8V

119	P32/ADC2	DVD key-press signal input
120	P33/ADC3	TV key-press signal input
121	VSSC	grounding
122	P24/PWM3	Background control signal output
123	P25/PWM4	SAW filter control signal
124	VDDC3	+1.8V
125	VSSC3	grounding
126	P12/INT2	MST interrupt signal input
127	P14/RX	MST data line
128	P15/TX	MST clock line

TDA15063H inside block diagram



2□ TDA9178 introduction

TDA9178 is a analog signal processor with standard YUV input and output interface .It provid three main process function: luminance vector, color vector and spectrum process. It can finish comprehensive picture improving function independently. The characteristics of the TDA9178 are below:

- Luminance Transient Improvement (LTI), Colour Transient improvement (CTI)
- Variable gamma control

- Self-suitable black level extend control
- Skin color correction, green intensity ,blue extend
- Noise measurement and reduced noise process founction
- Line Width Control (LWC)

TDA9178 PIN DESCRIPTION:

Pin	Pin name	Function
1	sandcastle input	sandcastle input
2	not connected	Grounding
3	ADC input 1	A/D convertor input 1
4	ADC input 2	A/D convertor input 2
5	ADC input 3	A/D convertor input 3
6	luminance input	Y input
7	address selection input	I2C address choose input port
8	U signal input	U input
9	V signal input	V input
10	test pin	Grounding
11	serial clock input (I2C-bus)	I2C bus clock signal
12	not connected	Not connected
13	not connected	Not connected
14	serial data input/output (I2C-bus)	I2C bus data signal
15	decoupling digital supply	connect decouple capacitor external
16	V signal output	V signal output
17	U signal output	U signal output
18	ground	Ground
19	luminance output	Y signal input
20	supply voltage	Supply power
21	SCAVEM output	Scan velocity modulate output
23	not connected	Grounding
24	not connected	Grounding

TDA9178 inside block diagram:

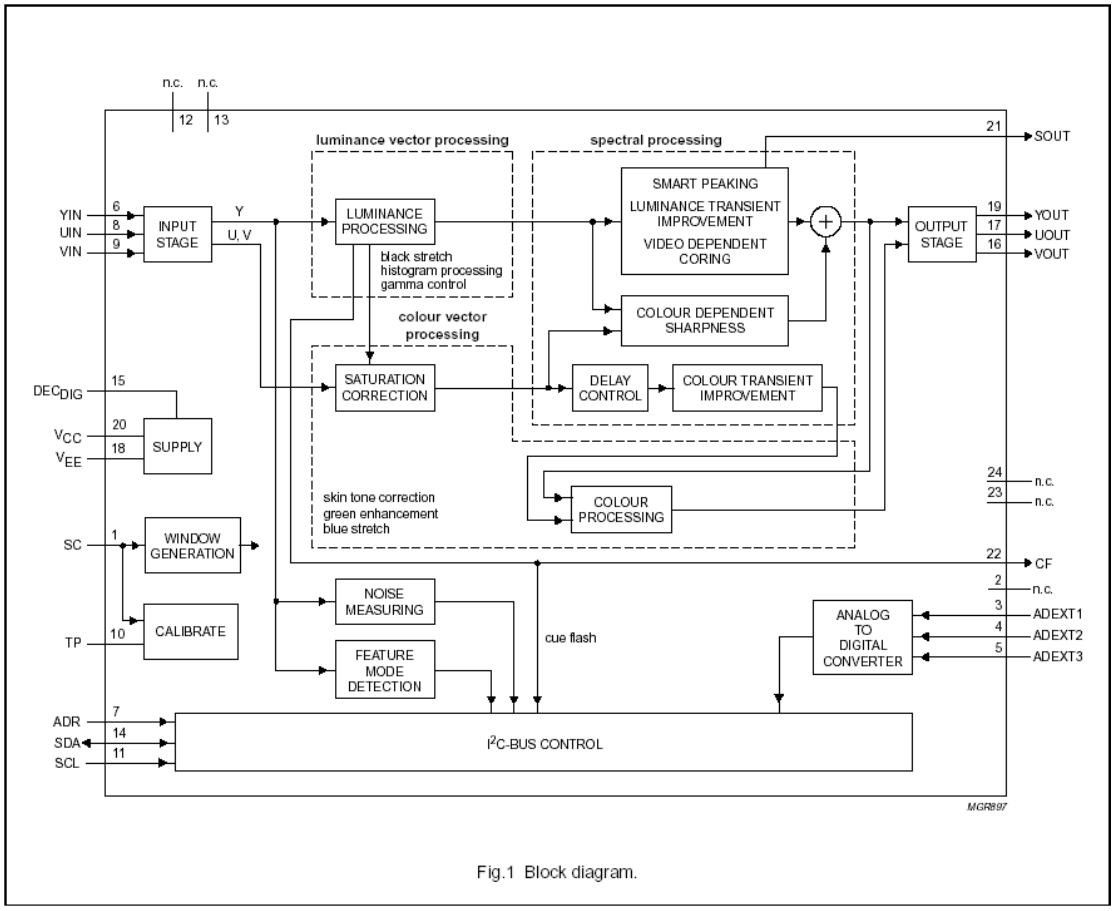


Fig.1 Block diagram.

3□ TDA1517AWT brief:

The TDA1517ATW is an double channel class-AB power amplifier contained in a plastic heat sink thin shrink small outline package (HTSSOP20). The device is primarily developed for multimedia applications.

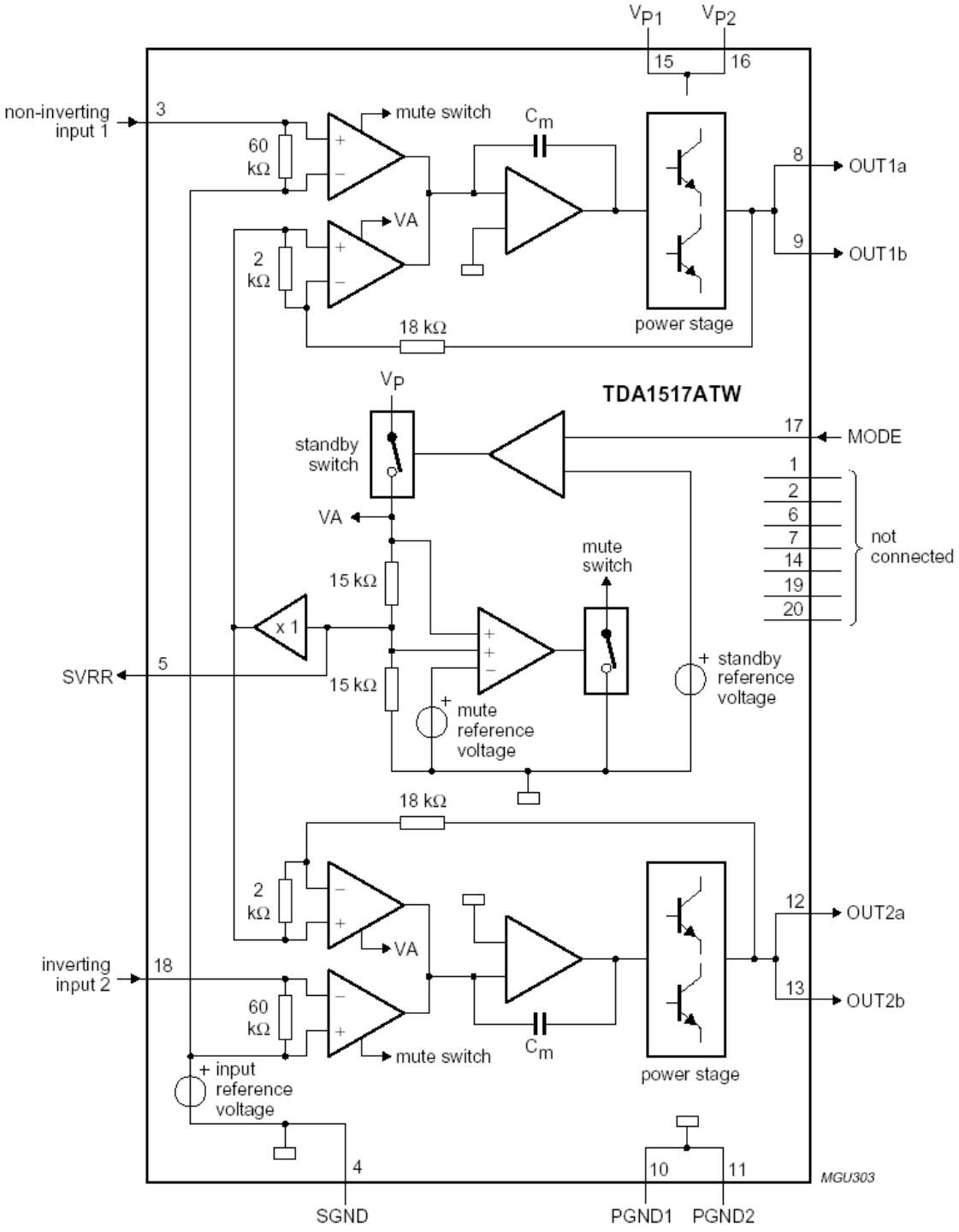
- Outside circuit is simple
- Mute□standby is controllable
- Temperature protect circuit
- Low noise switch
- Constant gain

TDA1517 PIN DESCRIPTION:

Pin	Pin name	function
3	non-inverting input	Audio input
5	supply voltage ripple rejection	Bias circuit filter
8□9	Output	Audio output
12□13	N.C.	Not connected
15□16	supply voltage	□12V power supply
17	mode select switch	Work mode select
18	inverting input	Reverse input terminal □connect capacitor to ground □

1□2□4□6□7□ 10□11□14□ 19□20	GND	ground

TDA1517 inside block diagram:



Chapter three Signal Processing Flowchart

This chapter mainly introduces analog signals process□video intensify process□ TV system control process□TV supply system of the Europe LCD TV.

One Analog signals process

1. IF/RF process

Completed by TAF-C21P1 RF tuner, output IF signal.

The Function of RF tuner is below:

Pin	symbol	function
1	AGC	Auto gain control voltage
2	TU	The TV do not connect
3	ADD	ground
4	SCL	I^2C bus□clock □
5	SDA	I^2C bus□data □
6	BM	+5V power supply
7	BM	+5V power supply
8	NC	Not connected
9	BTL	+32V power supply□form 0□32V tune voltage
10	NC	Not connected
11	IF	IF signal output

2. Image and sound process

UOC chip receives the IF signal seperated from SAW , detect and decode. Output RGB color analog signals from the 85□86□87 pin respectively. Output the main channel L□R audio signal from 60□61 pin. Output earphone channel L□ R audio signal from 62□63 pin. additional, Part number U7,TDA9178 complete the enhancement of quality of the picture ,by the output 74□75□76 pin Of UOC and the input 70□71□72 pin, combined with UOC to form a loop circuit. Further, AV□S-Video□YC signal of inside DVD(some types of TV have not) is also decoded inside of UOC chip, switch internal UOC with TV input and output a RGB color analog signal, send it to back-end process.

Two Digital signal process

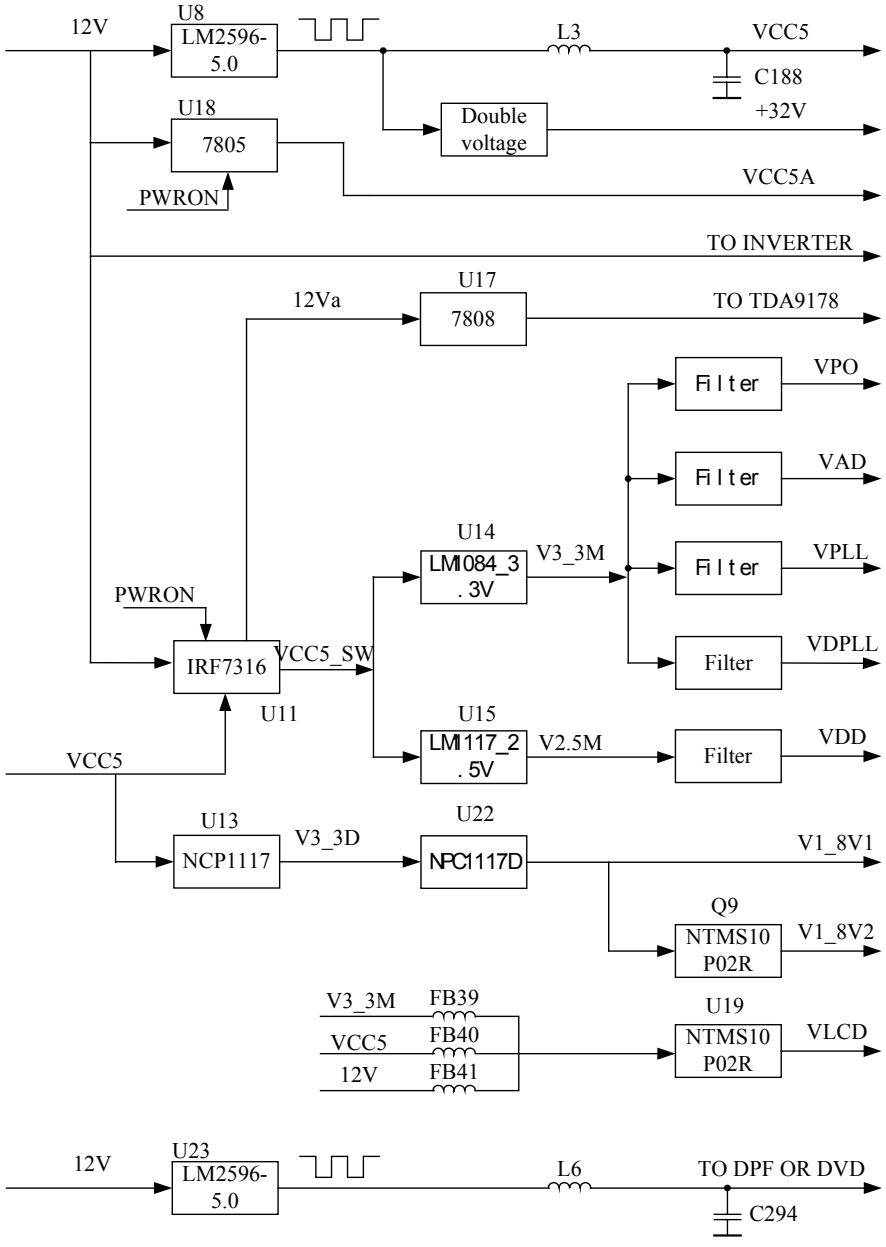
The analog RGB signal output from UOC and RGB signal output from DFP are switched and selected by a PI5V330A,input it into the 65□63□60 pin Of MST518. The RGB signal output from computer and HD-YpbPr signal are switched and selected by another PI5V330A,input into the 75□72□70□of MST518.This two channel RGB signal are switched inside MST518,then AD converter, video format transition, at last output digital color signal which is suitable for TFT drive circuit. MST518 process the pixels ratio converting of input video signal□the image auto optimization process, then process memory buffer□scaler□chroma matrix circuit□chroma look-up table□chroma space gain, etc. Output corresponding standard physical resolution digital color signal and corresponding sync, clock signal to TFT, control the TFT to display image correctly.

Three TV power supply system:

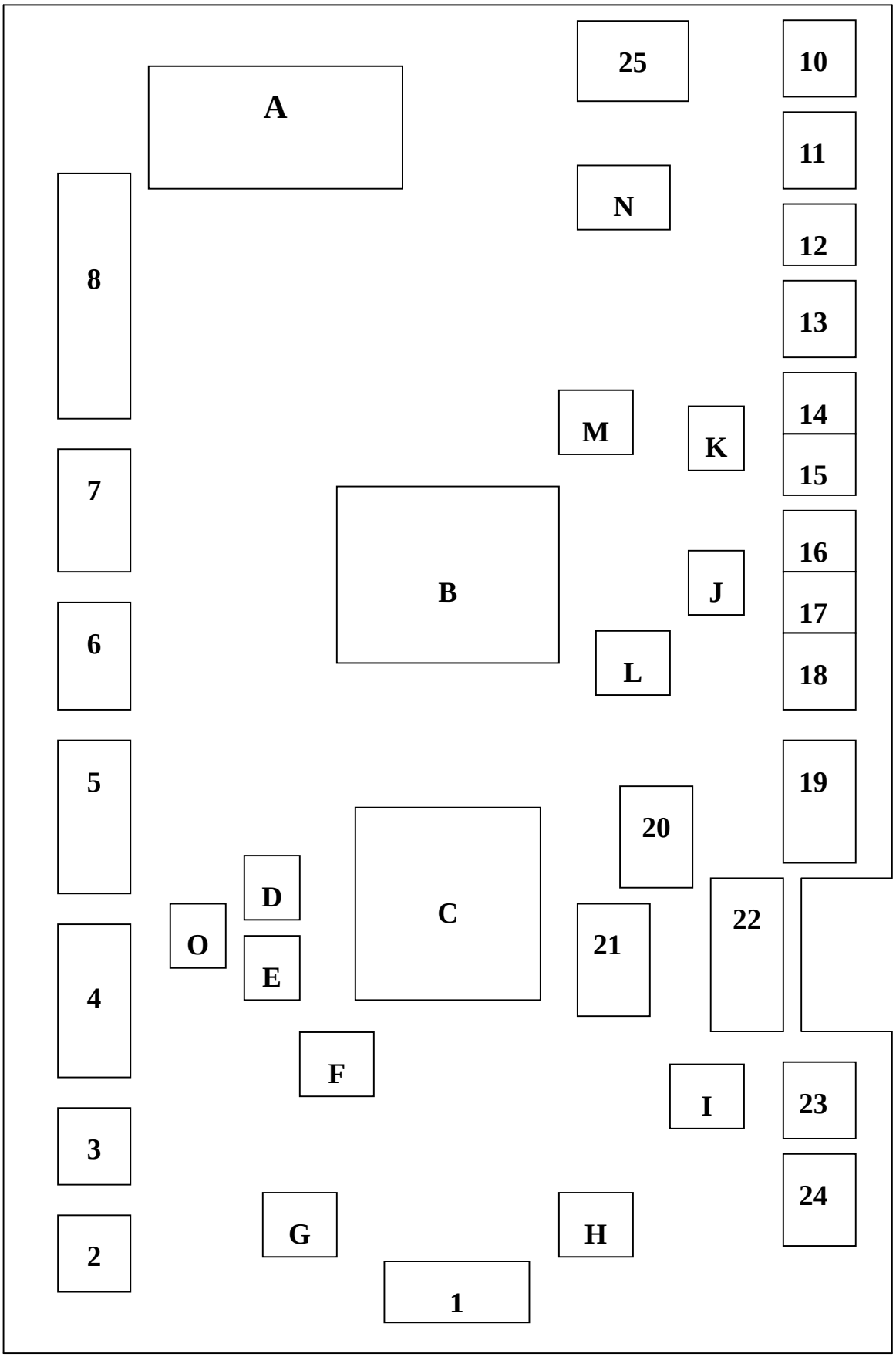
1. The supply power system of the main IC is below:

- 12V:the unit main power supply
- +34V:RF tuner tune voltage
- VCC5: stable and constant +5V power supply
- VCC5A: +5V power supply software can turn off
- V3_3D:UOC digital part supply power supply
- V1_8V1:UOC digital part constant supply power supply
- V1_8V2:UOC digital part power supply can be turned off
- V2_5M:MST518 digital core supply power supply
- V3_3M:MST518 supply power supply

2. The constitute and distributing of the TV



4. The main element in mainboard and location of socket and definition



Socket definition

number	name	Connect object	Function description
1	JP1	Connect socket	+12V, +12V, GNG, GND(use when inside power supply plank□ JP2 not use)
2	JP2	Connect adapter	+12V, GND, GND□use when outside connect adapter□ JP1not use□
3	J8	Connect outside VGA audio input	
4	J1	Connect outside VGA input	
5	J3	Connect outside HD-YpbPr input	
6	J4	Connect outside HD audio input	
7	J2	Connect outside S-video signal input	
8	J20	Connect outside AV input	
9	J9	Connect inside DVD signal input	
10	J21	Connect inside DVD signal input	
11	J7	Connect inside DVD K panel	Look circuit diagram□the second pin is 3.3V
12	J12	Connect earphone output panel	
13	J14	Connect speaker	
14	J13	Connect speaker	
15	J6	Connect TV K panel	Look circuit diagram □the second pin is 3.3V
16	J5	Connect remote control	Look circuit diagram□the fifth pin is 3.3V
17	J11	UOC debug socket	
18	J10	DPF digital photo-frame signal input	
19	J17	Connect display screen □TTL screen□	AU 20",15"
20	J16	Connect display screen □LVDS screen□	SAMSUNG 15",17"
21	J22	Connect display screen □TTL screen□	LG 20",17"
22	J15	MST518 debug socket	
23	J19	Supply DVD or DPF power	Look circuit diagram□the first □second □third pin are 3.3V
24	J18	Connect inverter	+12V, +12V, poor light switch□GND, DND,GND

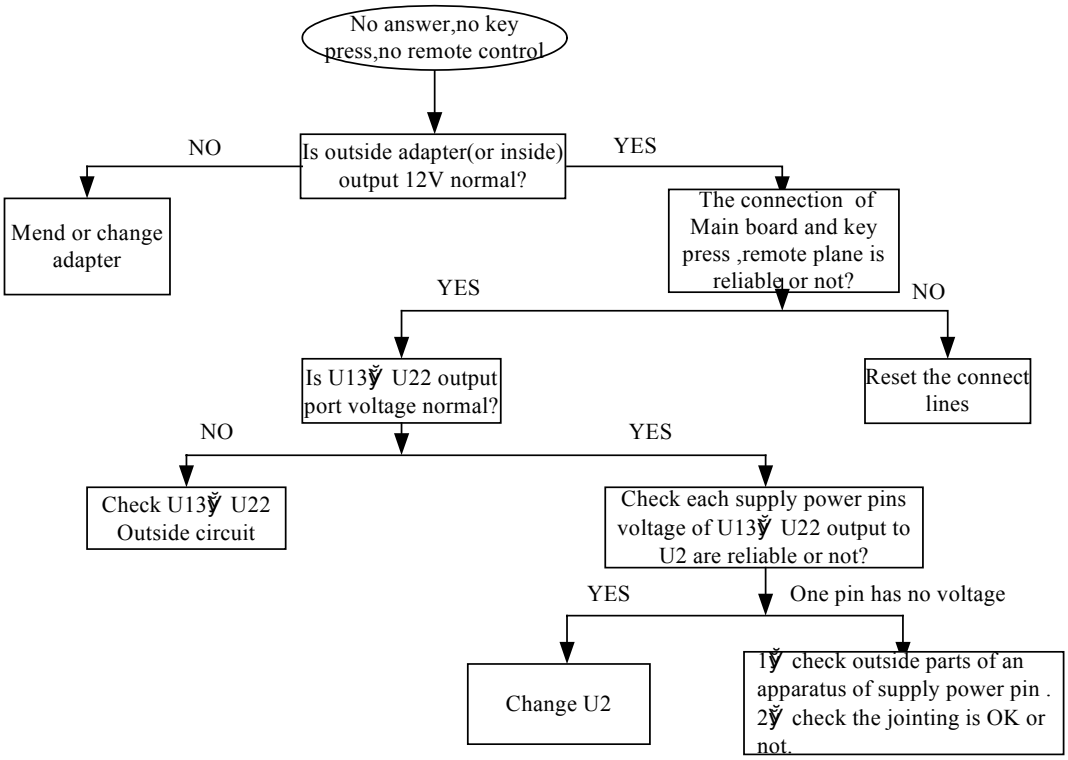
Explain of Main element

No.	name	element	Function description
A	A1	RF tuner TAF5-C21P1RW	RF input, IF output
B	U2	UOC(TDA15063H)	Video decode and MCU control
C	U3	MST518	AD converter and format transition
D	U20	PI5V330A	Video switch on/off
E	U6	PI5V330A	Video switch on/off
F	U11	IRF7316	MOS switch
G	U9	LM2596-5.0	Linear voltage IC
H	U23	LM2596-5.0	Linear voltage IC
I	U19	NTMS10P02	MOS switch
J	U21	TDA1517AWT	Audio power amplifier
K	U8	TDA1517AWT	Audio power amplifier
L	U4	24LC32A	EEPROM(store user control information)
M	Q9	Si2311DS	MOS switch
N	U12	IRF7316	MOS switch
O	U1	24LC21A	EEPROM(store display parameter information)

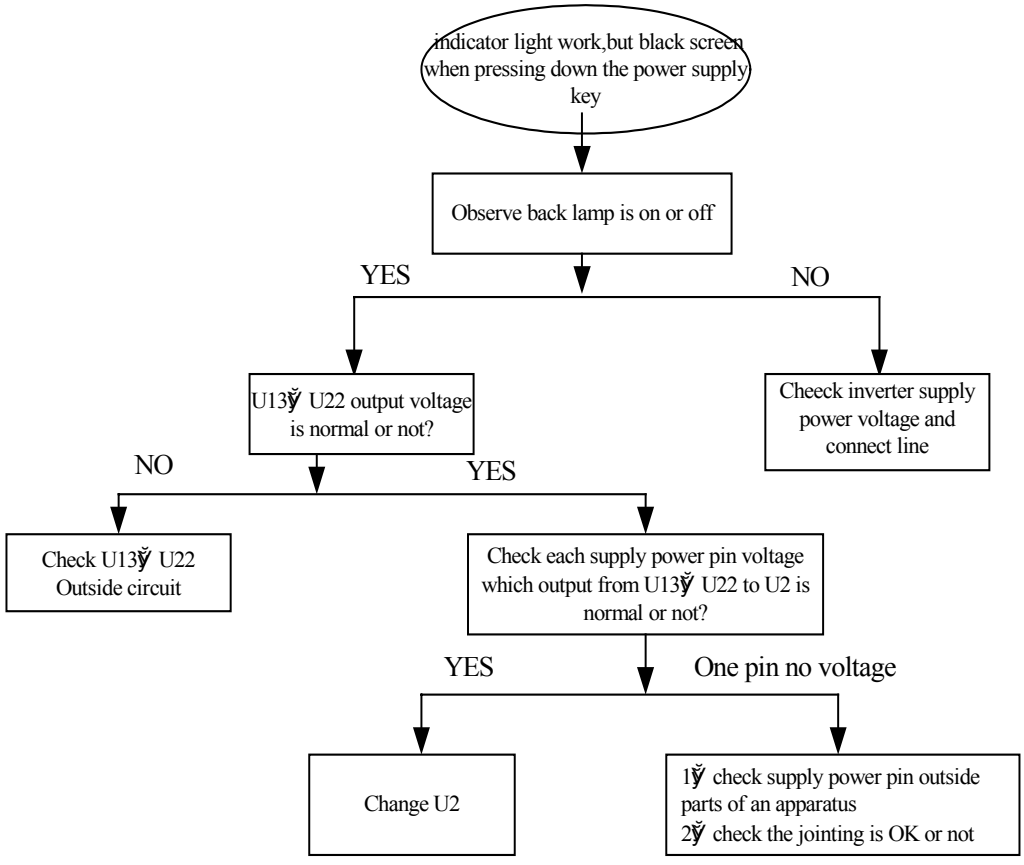
Chapter Four Typical troubleshooting flowchart and example

1 Typical troubleshooting flowchart

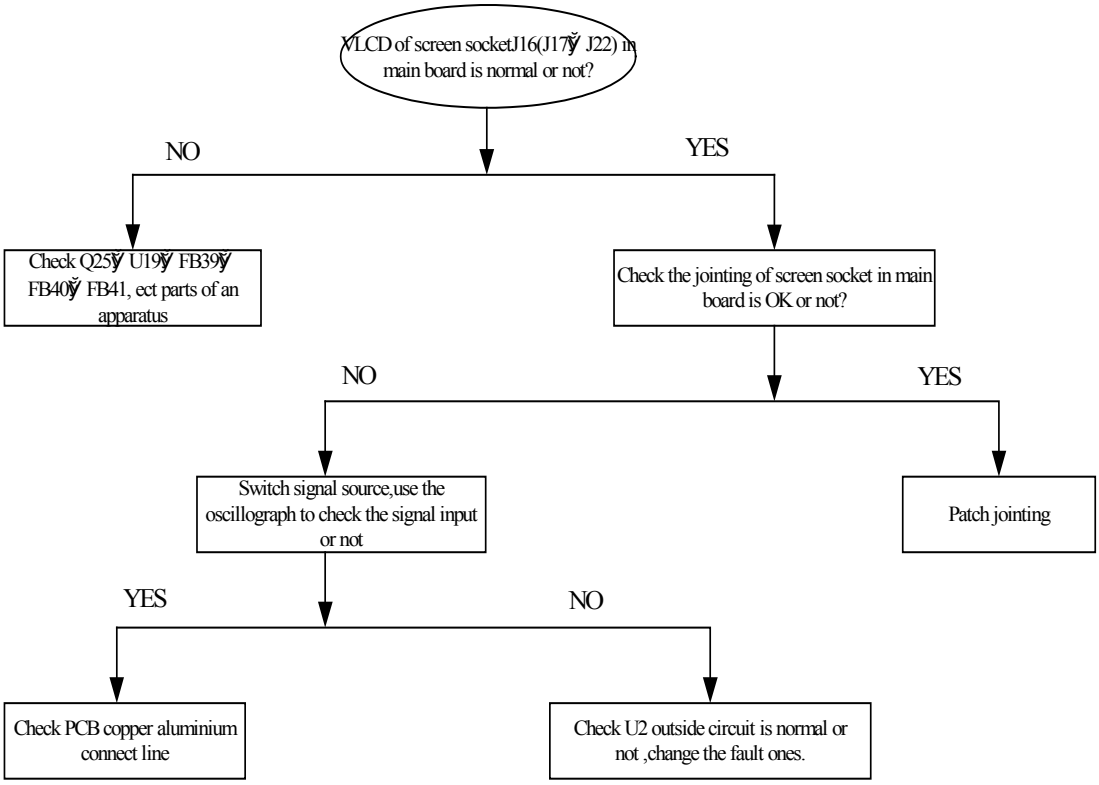
□1□not anything(haven't sound ,haven't picture, haven't indicator light),and not respond key-press□remote control.


No answer,no key press,no remote control
Is outside adapter(or inside) output 12V normal?
NO
YES
Mend or change adapter
The connection of Main board and key press ,remote plane is reliable or not?
YES
NO
Is U13ÿ U22 output port voltage normal?
Reset the connect lines
NO
YES
Check U13ÿ U22 Outside circuit
Check each supply power pins voltage of U13ÿ U22 output to U2 are reliable or not?
YES
One pin has no voltage
Change U2
1ÿ check outside parts of an apparatus of supply power pin .
2ÿ check the jointing is OK or not.

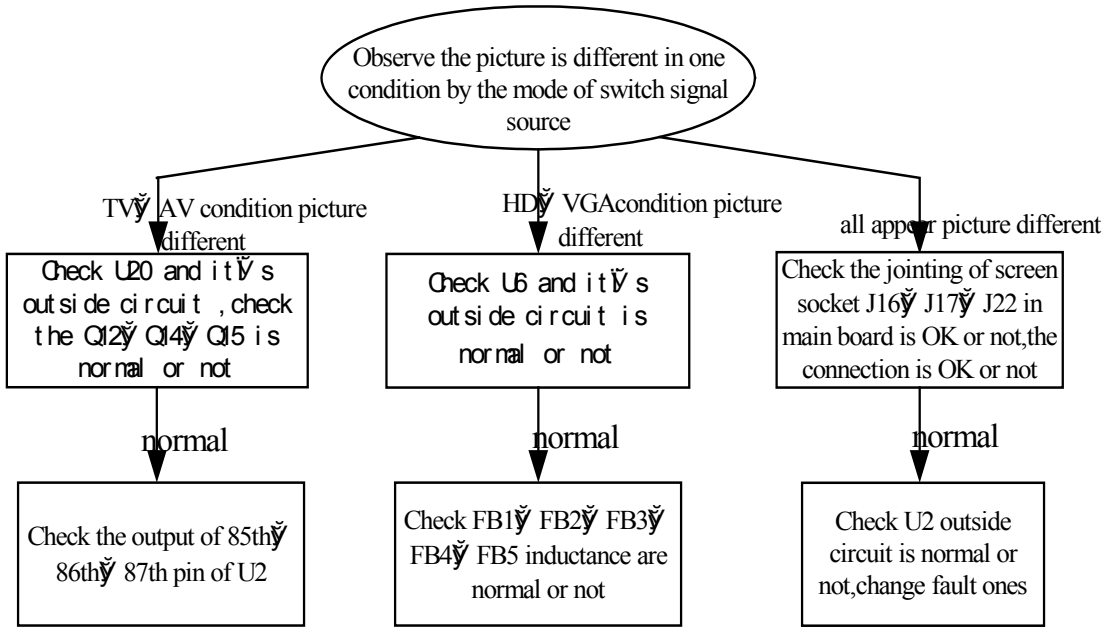
□2□Have sound not picture, indicator light work normally


indicator light work,but black screen when pressing down the power supply key
Observe back lamp is on or off
YES
NO
U13ÿ U22 output voltage is normal or not?
Cheeck inverter supply power voltage and connect line
NO
YES
Check U13ÿ U22 Outside circuit
Check each supply power pin voltage which output from U13ÿ U22 to U2 is normal or not?
YES
One pin no voltage
Change U2
1ÿ check supply power pin outside parts of an apparatus
2ÿ check the jointing is OK or not

□3□ White screen: the reason of the troubleshoot is the signal electrode electrode haven't working voltage. The TFT is always in transparent condition, so the whole screen is in white raster.


VLCD of screen socketJ16(J17ў J22) in main board is normal or not?
NO
YES
Check Q25ў U19ў FB39ў FB40ў FB41, ect parts of an apparatus
Check the jointing of screen socket in main board is OK or not?
NO
YES
Switch signal source,use the oscillograph to check the signal input or not
Patch jointing
YES
NO
Check PCB copper aluminium connect line
Check U2 outside circuit is normal or not ,change the fault ones.

(4) Picture abnormal□color abnormal □short of color


Observe the picture is different in one condition by the mode of switch signal source
TVў AV condition picture different
HDў VGAcondition picture different
all appear picture different
Check U20 and itў s outside circuit , check the Q12ў Q14ў Q15 is normal or not
Check U6 and itў s outside circuit is normal or not
Check the jointing of screen socket J16ў J17ў J22 in main board is OK or not,the connection is OK or not
normal
normal
normal
Check the output of 85thў 86thў 87th pin of U2
Check FB1ў FB2ў FB3ў FB4ў FB5 inductance are normal or not
Check U2 outside circuit is normal or not,change fault ones

2 The example of service

Example 1 Can't turn on the TV

Troubleshoot phenomenon: after connect power supply and turn on the power supply ,the ‘‘changhong ‘‘logo will not appear on screen. Press the key or use the remote control, the TV has no reflect, no display and black screen.

The process of maintenance : remove the plug of adapter output, measure adapter output voltage is +12V,the adapter works normally. check the connectiom with key-press panel□remote control panel and mainboard. if it is ok, the problem must be MCU not work. First check supply power of U2 chip. Connect power supply, then measure the voltage of the 2□4 pin of U13NTMS10P02 is 0.2V,and over-heat , the reason must be short circuit of power supply backend□You should remove the plug quickly, otherwise the chip must be bad. Use the multimeter to measure □confirm it is short circuit to ground. the places which connect U2 with 3.3V voltage are so many, you should disconnect and measure it one by one. when you disconnect the C68,if it is normal,C68 grounding Short circuit.

Example 2 No picture in VGA mode

Troubleshooting phenomenon: in TV/AV mode ,the image and sound is ok, PC (in VGA mode) is no picture, but have state icon.

The process of maintenance: first check the signal source, signal socket□ plug are ok or not. Because during switch the mode, the image display normally in non-PC mode ,it is proved that the backend image public processing channel is ok, namely U3MST518 and backend image signal processing circuit work normally. In PC mode, measure the arbitrary pin of 4,7,12 pin ,image date terminal of U6P15V330A by oscillograph. there are no waveform, change U6P15V330A and the Troubleshooting phenomenon disappear.

Example 3 No picture in VGA mode and the ‘‘signal beyond boundary’’ is appeared on screen.

Troubleshooting phenomenon: no picture in VGA mode and the ‘‘signal beyond bound’’ is appeared on screen. in TV/AV mode, image□sound is ok.

The process of maintenance: first check the signal output from the signal source is not standard or beyond the resolution which is supported by TFT. except of the two cases, the phenomenon comes from the TFT display. Under general circumstance it is caused by the abnormal of the horizon sync impulse ,vertical sync impulse of VGA signal. Inspect the 38th□39th pin of U3 by oscillograph, find the magnitude of horizon sync impulse is below the normal, measure the waveform of 13^{th} pin of VGA J1 ,if it is ok, so maybe resistance of the R23 will be largen, measure the resistance of R23 is 10K Ω,but the rating resistance is 1K Ω, so it is obvious that the magnitude of horizon sync. impulse is attenuated too large caused by value of couple

resistance R23 become large. So the pixel clock inside of the MST518 can not vibrate, result in the A/D converter of MST518 internal can not work normally . so appear no picture in VGA mode and "signal beyond boundary" on TFT screen.

Example 4 Can control TV by remote control, but can not control TV by key-press panel

Troubleshooting phenomenon: image□sound is ok under any source, use remote control to operate each function is ok, but can not control by using the key-press panel, failure completely.

The process of maintenance: first check the socket of J6 on mainboard ,the solder and touch of connector are ok or not. if it is ok, check the key-press panel ,measure each resistance, find R1 open circuit, change it .

Example 5 The image is ok after turn on the TV, but left speaker has no sound output

Troubleshooting phenomenon: the image is normal in TV mode, but the left speaker has no sound output, using remote control to operate ,each function is ok. use AV□PC audio input ,is still no sound output.

The process of maintenance: measure the waveform from 60th pin of UOC by oscillograph, according to signal flowchat, measure R227□R157□U8□C130 one by one, and observe the waveform is ok or not, find the back end of C130 have not waveform, change C130 and troubleshooting dissappear .

Chapter Five Spare part lists and easy damage part list

CHD-TD170F7

Material name	type□module NO.□	Material code	remark
Face frame	JUJ8.074.036	8807400360J	
Suspend screen	JUJ8.640.017	8864000170J	
Back cover	JUJ8.074.037	8807400370J	
base	JUJ8.070.012	8807000120J	
Accessories bag	JUJ6.479.049	8647900490J	
Mainboard groupware	JUJ6.690.032-5	8669000325J	Samsung screen use
Mainboard groupware	JUJ6.690.030-11	86690003211J	LG screen use
DVD drive	TDR-085	59C11060850	
Decode panel groupware	JUJ6.693.013	8669300130J	
Remote control	JUJ6.694.016	8669400160J	

panel groupware			
Key-press panel groupware	JUJ6.694.015	8669400150J	
DVD touch film key-press	JUJ6.618.004	8661800040J	
Earphone panel groupware	JUJ6.695.002	8669500020J	
Commutator groupware	JUJ6.691.007	8669100070J	
DVD output panel groupware	JUJ6.693.012	8669300120J	
TFT	LTM170W1-L01	68219601701	Samsung screen use
TFT	LC171W03	68211710305	LG screen use
inverter	INV17-4505	59324125010	Samsung screen use
inverter	INV17-6506	59324165060	LG screen use
Dynamoelectric speaker	Y2898-01-5W-4Ω	56231105042	
Remote control	KLC5B	8201803760L	
Inside power supply module	FSP084-1CD02C	67128084025	

CHD-TD201F7:

Material name	type□module NO.□	Material code	remark
Face frame	JUJ8.074.030	8807400300J	
Suspend screen	JUJ8.640.018	8886400180J	
Back cover	JUJ8.074.033-1	8807400331J	
base	JUJ8.070.012	8807000120J	
Accessories bag	JUJ6.479.040	8647900400J	
Mainboard groupware	JUJ6.690.032-3	8669000323J	AU screen use
Mainboard groupware	JUJ6.690.032-8	8669000328J	LG screen use
DVD drive	TDR-085	59C11060850	
Decode panel groupware	JUJ6.693.013	8669300130J	
Remote control panel groupware	JUJ6.694.016	8669400160J	
Key-press panel groupware	JUJ6.694.015	8669400150J	

DVD touch film key-press	JUJ6.618.003	8661800030J	
Earphone panel groupware	JUJ6.695.002	8669500020J	
Commutator groupware	JUJ6.691.008	8669100080J	
DVD output panel groupware	JUJ6.693.011	8669300110J	
TFT	A201SN01	68219020110	AU screen
TFT	LC201V02	68212010235	LG screen
inverter	INV18-605D	59324106054	AU screen use
inverter	INV20-606A□D□	59324126061	Lg screen use
Dynamoelectric speaker	Y38106-01-5W-4Ω	56231105043	
Remote control	KLC5B	8201803760L	
Inside power supply module	FSP084-1CD02C	67128084025	

CHD-W170F7:

Material name	type□groupware number□	Material code	remark
Face frame	JUJ8.074.036	8807400360J	
Back cover	JUJ8.074.037-2	8807400372J	
base	JUJ8.070.012	8807000120J	
Accessories bag	JUJ6.479.047	8647900470J	
Mainboard groupware	JUJ6.690.032-1	8669000321J	Samsung screen use
Mainboard groupware	JUJ6.690.032-10	86690003210J	LG screen use
Remote control panel groupware	JUJ6.694.016	8669400160J	
Key-press panel groupware	JUJ6.694.015	8669400150J	
Earphone panel groupware	JUJ6.695.002	8669500020J	
TFT	LTM170W1-L01	68219601701	Samsung screen
TFT	LC171W03	68211710305	LG screen
inverter	INV17-4505	59324125010	Samsung screen use
inverter	INV17-6506	59324165060	LG screen

			use
Dynamoelectric speaker	Y2898-01-5W-4Ω	56231105042	
Remote control	KLC5B	8201803760L	
Inside power supply module	FSP084-1CD02C	67128084025	

CHD-TM201F7:

Material name	type□module NO.□	Material code	remark
Face frame	JUJ8.074.030	8807400300J	
Back cover	JUJ8.074.033-2	8807400332J	
base	JUJ8.070.012	8807000120J	
Accessories bag	JUJ6.479.038	8647900380J	
Mainboard groupware	JUJ6.690.032	8669000320J	Au screen use
Mainboard groupware	JUJ6.690.032-7	8669000327J	LG screen use
Remote control panel groupware	JUJ6.694.016	8669400160J	
Key-press panel groupware	JUJ6.694.015	8669400150J	
Earphone panel groupware	JUJ6.695.002	8669500020J	
TFT	A201SN01	68219020110	AU screen
TFT	LC201V02	68212010235	LG screen
inverter	INV18-605D	59324106054	AU screen use
inverter	INV20-606A□D□	59324126061	LG screen use
Dynamoelectric speaker	Y38106-01-5W-4Ω	56231105043	
Remote control	KLC5B	8201803760L	
Inside power supply module	FSP084-1CD02C	67128084025	

CHD-TM150F7:

Material name	type□module NO.□	Material code	remark
Face frame	JUJ8.074.038	8807400380J	
Back cover	JUJ8.074.039	8807400390J	
Base	JUJ8.070.015	8807000150J	
Accessories bag	JUJ6.479.046	8647900460J	

Mainboard groupware	JUJ6.690.032-2	8669000322J	
Remote control panel groupware	JUJ6.694.016	8669400160J	
Key-press panel groupware	JUJ6.694.017	8669400170J	
Earphone panel groupware	JUJ6.695.002	8669500020J	
TFT	LTM150XH-L06	68219601565	
inverter	INV15-474	59324104740	
dynamoelectric speaker	Y2898-01-5W-4Ω	56231105042	
Remote control	KLC5B	8201803760L	
Adapter	CHA-1204	8290800520B	

Chapter Six the Parameter adjustment of factory repairment mode Factory mode introduction:

The method of Entering into factory mode: turn down the volume to 0, press down the key of "mute" in remote control, then press the key of "menu" in remote control. press CH+ and CH- choose the items which need to adjust.
The method of exiting from factory mode: press the in remote control, after exiting from the factory mode, you should turn on the TV again.
Now the introduction of the modes which are often used is below, the others are design parameter mode, not permit to modify .

M6 The fast key is the key of "language"
IFPL Adjust the scale of picture and sound the IF signal
M6 The fast key is the key of "language"
TOP Tune AGC voltage
M13 The fast key is the key of "DVD"
DVD The switch of DVD source
DPF The switch of DPF source
M17
LOGO LOGO display or not
BLUEBACK Blue screen switch
M24
AUTO Auto revise
M25 The fast key is the key of "title"
INIT Initialization program
M28 The fast key is the key of "0"
IIC BUS OPEN Open bus

CHD-TD170F7:

Material name	type□module NO.□	Material code	scale	remark
Face frame	JUJ8.074.036	8807400360J	0.1%	
Suspend screen	JUJ8.640.017	8864000170J	0.1%	
Back cover	JUJ8.074.037	8807400370J	0.1%	
base	JUJ8.070.012	8807000120J	0.1%	
Accessories bag	JUJ6.479.049	8647900490J	0.1%	
Mainboard groupware	JUJ6.690.032-5	8669000325J	0.2%	Samsung screen use
Mainboard groupware	JUJ6.690.030-11	86690003211J	0.2%	LG screen use
DVD drive	TDR-085	59C11060850	0.2%	
Decode panel groupware	JUJ6.693.013	8669300130J	0.2%	
Remote control panel groupware	JUJ6.694.016	8669400160J	0.1%	
Key-press panel groupware	JUJ6.694.015	8669400150J	0.1%	
DVD touch film key-press	JUJ6.618.004	8661800040J	0.2%	
Earphone panel groupware	JUJ6.695.002	8669500020J	0.1%	
Commutator groupware	JUJ6.691.007	8669100070J	0.1%	
DVD output panel groupware	JUJ6.693.012	8669300120J	0.1%	
TFT	LTM170W1-L01	68219601701	0.05%	Samsung screen use
TFT	LC171W03	68211710305	0.05%	Lg screen use
inverter	INV17-4505	59324125010	0.3%	Samsung screen use
inverter	INV17-6506	59324165060	0.3%	LG screen use
Dynamoelectric speaker	Y2898-01-5W-4Ω	56231105042	0.05%	
Remote control	KLC5B	8201803760L	0.05%	
Inside power supply module	FSP084-1CD02C	67128084025	0.3%	

CHD-TD201F7:

Material name	type□module NO.□	Material code	Scale	remark
Face frame	JUJ8.074.030	8807400300J	0.1%	

Suspend screen	JUJ8.640.018	8886400180J	0.1%	
Back cover	JUJ8.074.033-1	8807400331J	0.1%	
base	JUJ8.070.012	8807000120J	0.1%	
Accessories bag	JUJ6.479.040	8647900400J	0.1%	
Mainboard groupware	JUJ6.690.032-3	8669000323J	0.2%	AU screen use
Mainboard groupware	JUJ6.690.032-8	8669000328J	0.2%	Lg screen use
DVD drive	TDR-085	59C11060850	0.2%	
Decode panel groupware	JUJ6.693.013	8669300130J	0.2%	
Remote control panel groupware	JUJ6.694.016	8669400160J	0.1%	
Key-press panel groupware	JUJ6.694.015	8669400150J	0.1%	
DVD touch film key-press	JUJ6.618.003	8661800030J	0.2%	
Earphone panel groupware	JUJ6.695.002	8669500020J	0.1%	
Commutator groupware	JUJ6.691.008	8669100080J	0.1%	
DVD output panel groupware	JUJ6.693.011	8669300110J	0.1%	
TFT	A201SN01	68219020110	0.05%	AU screen
TFT	LC201V02	68212010235	0.05%	LG screen
inverter	INV18-605D	59324106054	0.3%	AU screen use
inverter	INV20-606A□D□	59324126061	0.3%	Lg screen use
Dynamoelectric speaker	Y38106-01-5W-4Ω	56231105043	0.05%	
Remote control	KLC5B	8201803760L	0.05%	
Inside power supply module	FSP084-1CD02C	67128084025	0.3%	

CHD-W170F7:

Material name	type□groupware number□	Material code	Scale	remark
Face frame	JUJ8.074.036	8807400360J	0.1%	
Back cover	JUJ8.074.037-2	8807400372J	0.1%	
base	JUJ8.070.012	8807000120J	0.1%	
Accessories bag	JUJ6.479.047	8647900470J	0.1%	
Mainboard groupware	JUJ6.690.032-1	8669000321J	0.2%	Samsung screen use

Mainboard groupware	JUJ6.690.032-10	86690003210J	0.2%	LG screen use
Remote control panel groupware	JUJ6.694.016	8669400160J	0.1%	
Key-press panel groupware	JUJ6.694.015	8669400150J	0.1%	
Earphone panel groupware	JUJ6.695.002	8669500020J	0.1%	
TFT	LTM170W1-L01	68219601701	0.05%	Samsung screen
TFT	LC171W03	68211710305	0.05%	LG screen
inverter	INV17-4505	59324125010	0.3%	Samsung screen use
inverter	INV17-6506	59324165060	0.3%	LG screen use
Dynamoelectric speaker	Y2898-01-5W-4Ω	56231105042	0.05%	
Remote control	KLC5B	8201803760L	0.05%	
Inside power supply module	FSP084-1CD02C	67128084025	0.3%	

CHD-TM201F7:

Material name	type□module NO.□	Material code	Scale	remark
Face frame	JUJ8.074.030	8807400300J	0.1%	
Back cover	JUJ8.074.033-2	8807400332J	0.1%	
base	JUJ8.070.012	8807000120J	0.1%	
Accessories bag	JUJ6.479.038	8647900380J	0.1%	
Mainboard groupware	JUJ6.690.032	8669000320J	0.2%	Au screen use
Mainboard groupware	JUJ6.690.032-7	8669000327J	0.2%	LG screen use
Remote control panel groupware	JUJ6.694.016	8669400160J	0.1%	
Key-press panel groupware	JUJ6.694.015	8669400150J	0.1%	
Earphone panel groupware	JUJ6.695.002	8669500020J	0.1%	
TFT	A201SN01	68219020110	0.05%	AU screen
TFT	LC201V02	68212010235	0.05%	LG screen
inverter	INV18-605D	59324106054	0.3%	AU screen use
inverter	INV20-606A□D□	59324126061	0.3%	LG screen use

Dynamoelectric speaker	Y38106-01-5W-4Ω	56231105043	0.05%	
Remote control	KLC5B	8201803760L	0.05%	
Inside power supply module	FSP084-1CD02C	67128084025	0.3%	

CHD-TM150F7:

Material name	type□module NO.□	Material code	Scale	remark
Face frame	JUJ8.074.038	8807400380J	0.1%	
Back cover	JUJ8.074.039	8807400390J	0.1%	
Base	JUJ8.070.015	8807000150J	0.1%	
Accessories bag	JUJ6.479.046	8647900460J	0.1%	
Mainboard groupware	JUJ6.690.032-2	8669000322J	0.2%	
Remote control panel groupware	JUJ6.694.016	8669400160J	0.1%	
Key-press panel groupware	JUJ6.694.017	8669400170J	0.1%	
Earphone panel groupware	JUJ6.695.002	8669500020J	0.1%	
TFT	LTM150XH-L06	68219601565	0.05%	
inverter	INV15-474	59324104740	0.3%	
Dynamoelectric speaker	Y2898-01-5W-4Ω	56231105042	0.05%	
Remote control	KLC5B	8201803760L	0.05%	
Adapter	CHA-1204	8290800520B	0.3%	